

What is Claimed is:

1. A flow rate measuring apparatus comprising:

an ultrasonic transmission section for transmitting an ultrasonic wave to fluid flowing in a flow passage;

5 an ultrasonic receiving section for receiving an ultrasonic wave which has propagated through the fluid;

a transmission timing control section constructed so as to permit said ultrasonic transmission section to transmit an ultrasonic wave in accordance with a plurality of transmission modes different in transmission timing from each other; and

10 a flow rate operation section for calculating a flow rate of the fluid on the basis of an output signal of said ultrasonic receiving section.

2. A flow rate measuring apparatus as defined in claim

15 1, further comprising a transmission mode selection section for carrying out change-over among said transmission modes based on a result of the calculation by said flow rate operation section.

3. A flow rate measuring apparatus as defined in claim 1, wherein said transmission modes include:

20 a first transmission mode which permits an ultrasonic wave to be transmitted at a predetermined timing for every period of a flow waveform of the fluid; and

25 a second transmission mode which permits an ultrasonic wave to be transmitted at a timing shifted by a predetermined time for every period of the flow waveform of the fluid.

4. A flow rate measuring apparatus as defined in claim 2, wherein said transmission modes include:

30 a first transmission mode which permits an ultrasonic wave to be transmitted at a predetermined timing for every period of a flow waveform of the fluid; and

a second transmission mode which permits an ultrasonic wave to be transmitted at a timing shifted by a predetermined time for every period of the flow waveform of the fluid.

5. A flow rate measuring apparatus as defined in claim

3, wherein said transmission modes further include a third transmission mode which permits an ultrasonic wave to be transmitted at predetermined intervals.

5 6. A flow rate measuring apparatus as defined in claim 4, wherein said transmission modes further include a third transmission mode which permits an ultrasonic wave to be transmitted at predetermined intervals.

10 7. A flow rate measuring apparatus as defined in claim 4, further comprising a transmission timing setting section for resetting a transmission timing of said first transmission mode in accordance with a result of the calculation by said flow rate operation section;

15 said transmission mode selection section carrying out change-over from said second transmission mode to said first transmission mode thus reset.

20 8. A flow rate measuring apparatus as defined in claim 6, further comprising a transmission timing setting section for resetting a transmission timing of said first transmission mode in accordance with a result of the calculation by said flow rate operation section;

25 said transmission mode selection section carrying out change-over from said second transmission mode to said first transmission mode thus reset.

30 9. A flow rate measuring apparatus as defined in claim 6, further comprising a flow rate variation judging section for judging whether or not a variation in flow rate is reduced based on a result of the calculation by said flow rate operation section;

35 said transmission mode selection section carrying out change-over from said first or second transmission mode to said third transmission mode when a variation in flow rate is reduced.

40 10. A flow rate measuring apparatus as defined in claim 8, further comprising a flow rate variation judging section for judging whether or not a variation in flow rate is reduced based

on a result of the calculation by said flow rate operation section;

5 said transmission mode selection section carrying out change-over from said first or second transmission mode to said third transmission mode when a variation in flow rate is reduced.